DOCUMENT RESUME

ED 457 402 CE 082 463

AUTHOR Goins, Shannon
TITLE Blindness and Computer Networking at iTEC [Information Technology Education Center].
PUB DATE 2001-10-15
NOTE 6p.; Produced by iTEE, Information Technology Education Center, in Partnership with Lions World Services for the Blind.
PUB TYPE Reports - Descriptive (141)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Assistive Devices (for Disabled); Certification; Communication Aids (for Disabled); *Computer Networks; *Computer Science Education; Course Content; Information Technology; Internship Programs; Job Training; Partnerships in Education; Postsecondary Education; Special Education; Special Needs Students; Systems Development; *Technical Institutes; *Technical Occupations; *Visual Impairments
IDENTIFIERS *Computer Occupations; Network Management

ABSTRACT

A new program to train blind and visually impaired individuals to design and run a computer network has been developed. The program offers the Microsoft Certified Systems Engineer (MCSE) training. The program, which began in February 2001, recently graduated its first class of students, who are currently completing 1-month internships to complete their 9-month program. A second class began in August 2001, and recruiting for a class scheduled for February 2002 is under way. Beginning with the February 2002 class, the 1-month internship will be extended to 2 months. In the program, visually impaired students study the same curriculum as students without sight impairments. The only difference is that visually impaired students use adaptive software to help them access their computers and custom-designed tactile devices to comprehend network diagraming. Blind students use a program known as JAWS, which reads the screen to the user. Computer-integrated print magnifiers enable students to magnify textbooks and handouts while still looking at their computer screen. Upon completing the course, students are able to perform various skills related to designing and operating a computer network, including installing, configuring, and upgrading various versions of the Windows operating system and creating and managing user accounts. (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
S. Boins
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED 457 402

Blindness and Computer Networking at iTec

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Summary:

During the last year, a new training program for blind and visually impaired individuals has been developed that gives them an opportunity that they have not had before. iTec has partnered with Lions World Services for the Blind to offer the Microsoft Certified Systems Engineer, MCSE, certification training. Although computers have been used for some time to assist people with visual impairment, teaching these individuals to design and run a computer network is a new idea.

The program, which began in February of 2001, has just graduated its first class of students who are currently doing one-month long internships to complete the 9-month program. A second class got underway on August 6th of this year, and recruiting for the third class, which will begin in February of 2002, is in full swing. Beginning with the class in February, the internship will be extended to a 2-month period, bringing the total length of the program to 10 months.

The visually impaired students study the exact same curriculum as students without sight impairment. The only difference lies in how they are taught. Students use adaptive software to help them access their computers and utilize custom-designed tactile devices to comprehend network diagramming. Blind students use a program known as JAWS that reads the screen to the user. Imagine for a moment turning off your monitor and throwing away your mouse - that's what it's like for them. Students who still have partial vision utilize a program called ZoomText that acts like a great big magnifying glass, allowing the user to increase dramatically the size of the images and text on the screen. Additionally, we have 2 computer-integrated Aladdin Genie Pro print magnifiers for the classroom that students can use to magnify textbooks and handouts while still looking at their computer screen.

BEST COPY AVAILABLE

CE082463

The certification exams that the students must pass are standardized by Microsoft. The students are given no special allowances due to their impairment. In addition to the lengthy scenario-based questions, they must be able to figure out the drag-and-drop and diagramming questions just like everyone else. The result is that their industry-standardized MCSE certification holds up to the certification of any other MCSE anywhere else in the world. To date, our leading test-taker in the class has passed 4 of the 7 required exams to obtain an MCSE, and he is scheduled soon to take his 5th exam.

When the students have completed the entire MCSE course, their skill set includes, but is not limited to the following major skills:

- Identify the information technology needs of an organization and design an information technology solution to fit those needs
- Troubleshoot and correct hardware problems and software configuration issues
- Install and configure Windows 2000 Professional and Server
- Connect Windows 2000 Clients to networks and the Internet
- Create and manage user accounts
- Use groups to manage resources such as files, programs, and printers
- Configure and manage disks and partitions
- Design a network that incorporates security as part of the fundamental design
- Upgrade a Windows NT 4.0 network to Windows 2000

The chance to learn these skills and become MCSE certified gives blind and visually impaired individuals a new career option. It goes without saying that it is a considerable challenge to achieve in this program. It requires great deal of ambition, sacrifice, and elbow grease on behalf of each and every student involved. The result, however, is a class full of effective and productive individuals who have considerable earning power in the job market.

More Information:

The program came into being as a result of iTec becoming aware that visually impaired individuals could not find adequate accommodation for computer networking classes, and Lions World wanting to expand their program offerings. The outcome was a partnership between the two organizations in which Lions World recruits potential students and puts them through an extensive evaluation process before recommending them for acceptance to the program. Once students have been accepted, iTec trains the students for 8 months, Monday -Thursday (8am - 4pm), using a customized delivery program. Thereafter, the students participate in internships around the greater Little Rock area.

In order to prepare for teaching this course, iTec instructors and staff had to undergo sensitivity training provided by Lions World Services for the Blind. As an institution that would be providing services to a large number of blind students, it was necessary for us to understand the needs of the blind student. We learned about things such as diabetic retinopathy and retinitis pigmentosa, two of the leading causes of blindness, as well as how and when to assist blind individuals. The feeling of wanting to help someone but not wanting to offend them by offering assistance was one of the things we had to overcome initially. It is a natural reaction, but we learned that we were the ones with that feeling, not the blind students. That sounds very cliché, but once you are around a building full of blind people, you instinctively learn when people need your assistance. It is based more off of the individual according to his or her needs and abilities than it is on the condition of blindness.

At first, there were many questions concerning the feasibility of such a program. We had to first learn how to utilize the adaptive software that would be used in the classroom. The Assistive Technology instructor at Lions World spent many hours working to train iTec's instructors on the different types of adaptive software. Then we did a great deal of research on how that adaptive software functioned with Windows 2000 network administration tools. Although there are some tools that are tricky to use with adaptive software, most tasks are straightforward. The interfaces that do pose a challenge when using adaptive software just require a little more practice to master.

One of the first objectives that we undertake as a class is to orient the students with the Windows 2000 interface. Windows comes with a standard set of keyboard commands that allow any user to work without using a mouse. This method works to execute many of the commands the students need to perform. However, in order to read the entire screen so that a blind student can hear all of the information present, a screen reading program such as JAWS is necessary. JAWS makes a special cursor available that is not restricted to certain fields like the standard Windows cursor. Mastery of these two sets of commands gives users full access to all interfaces.

Some concepts that must be learned do not involve working on the computer. In order to learn diagramming for networking design theory, shapes with Velcro and felt boards are used, for example. There are also very complicated binary number math problems that students must be able to work. These problems involve strings of 1's and 0's that occur in groups that are each 8 digits long. To help students conceptualize the binary numbering scheme, we use egg cartons and sugar packets to represent those groups of numbers. That way, a student can be presented with a complex problem in a tactile form, making it simpler for them to ask questions and for the instructor to explain the answer.

Materials preparation has been one of the most time-consuming aspects of teaching this course. In addition to the custom-designed materials just mentioned, all tests, worksheets, notes, and books must be made available in a number of formats. Students who have mild to moderate visual difficulties might require their materials in print format, only in a larger font size. Those students who have very severe impairments or who are totally blind might request to have their materials in digital format, so we just provide those on floppy disks. All the books that we utilize have the text on CD ROM. By taking it upon ourselves to ensure that materials are easily available, we free up the students to focus on the subject matter instead of wondering how they will be able to get a copy of the notes read off onto a recorder or scanned into an imaging program.

As with all of our programs, a primary skill that is taught is critical thinking. Working in a networking environment requires high-level analytical skills in order to discern one problem from another. Students must troubleshoot lab problems and are presented with lengthy scenario-based questions that require them to scrutinize all possible aspects of a network. When our students complete the program they are well-prepared to deal with a wide range of network problems.

The course is specifically designed to cater to the longer periods of time needed in lab. Mornings are usually spent in lecture, and the afternoons are reserved for lab exercises. By separating the two class sections, which are normally taught in conjunction with one another, the students are able to focus on concepts being taught without getting lost navigating the interface. During lab, students first do the labs together slowly so that everyone can navigate correctly, and then each student can practice that task again at his or her own pace.

The internship that follows the in-class studies provides the students with the opportunity to put their skills to work. Current employers who are sponsoring the interns include Arkansas Department of Information Services, Intelistaf, and the Little Rock Air Force Base. As the first class enters its second week of internships, the comments we have received back from both the students and the employers have been extremely favorable. The students get the chance to show off what they know and the employers, many of whom at first were happy to get a hold of "free labor" for a month, have come to rely on the expertise of their student interns for critical decision-making in the workplace regarding the use of Windows 2000.